

We claim:

1. A method of forming a protein-polymer conjugate comprising reacting a monomer with a chemically activated site on a protein or a protein modified to include polymerization initiation sites.
2. The method of claim 1 wherein the activated site is an amino acid modified by an initiator or an initiator is added to the protein to provide an initiator site, or an artificially created initiator amino acid is formed on the protein, or recombinant proteins are generated to include artificial amino acids containing an initiator fragment.
3. The method of claim 1 further including removing the unreacted monomer to obtain a purified protein-polymer conjugate.
4. The method of claim 1 wherein a non-interacting initiator which does not bind to the protein is added and the polymer grown from non-interacting initiator is not covalently bound to the protein.
5. The method of claim 4 further including removing any non-bonded polymer to obtain a purified protein-polymer conjugate.
6. A method of forming a protein-polymer conjugate comprising modifying the protein to be reactive with a monomer and reacting the modified protein with said monomer.
7. A method of forming a protein-polymer conjugate comprising modifying the protein to have a bromoisobutyrate functionality suitable for initiation of radical polymerization and, using atom transfer radical polymerization, reacting the modified protein with monomer.
8. A method of forming a protein-polymer conjugate comprising modifying the protein by reacting it with propylmercapto-pyridine 2-bromoisobutyrate and then forming a conjugate by reacting with N-isopropylacrylamide.
9. A method of forming a protein-polymer conjugate comprising modifying the protein by interacting with a bromoisobutyrate-modified biotin initiator, mixing said protein modified by the bromoisobutyrate-modified biotin initiator with a non-interacting bromoisobutyrate-modified solid phase resin and adding to said mixture a suitable reactive monomer under conditions suitable to initiate polymerization of the protein

modified by the bromoisobutyrate-modified biotin initiator with the monomer to form the protein-polymer conjugate.

10. The method of claim 9 wherein the protein is streptavidin.
11. The method of claim 9 wherein the monomer is N-isopropylacrylamide.
12. A protein-polymer conjugate comprising an initiator-modified protein bound to a polymer with the initiator as a link between the protein and the polymer, the modified protein reacting with a monomer that then polymerizes to form the conjugate.